FRAGILE
HANDLE WITH CARE

Glass Sponges Need Further Protection in Howe Sound

Executive Summary

- Glass sponges are animals that combat climate change and provide critical habitat for commercially valuable fish.
- Made of silica glass, they are extremely breakable: thousands of years of growth can be instantly destroyed if touched by traps or other fishing gear.
- While steps have been taken to preserve some glass sponge reefs, many reefs remain at risk in Howe Sound.
- Further action is needed to establish MPAs around all reefs, and to inform the public about closed marine areas and the threats to these valuable reefs.

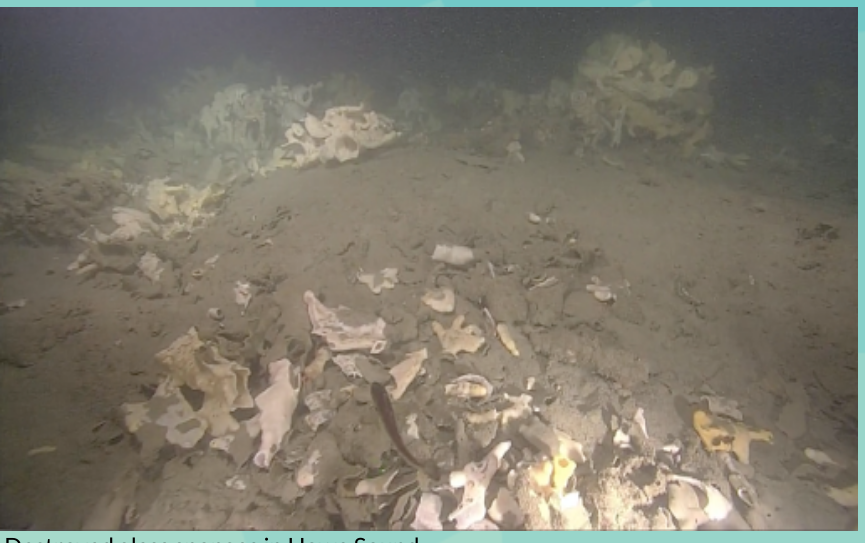
Healthy glass sponges and juvenile yelloweye rockfish in Howe Sound.
Credit: Adam Taylor. [6]

Why Are Glass Sponges Important?

Economic Importance:
- Provides habitat for commercially valuable and endangered rockfish and shrimp.
- Attracts international research and tourism: Howe Sound has the only reefs in the world shallow enough to reach by air diving, only 25 meters deep. [3]

Extremely Efficient Water Filtration:
- 1 square meter of glass sponges filters 25,400 to 45,150 L of water per day. Reefs in Howe Sound filter over 17 billion L of water every day, equivalent to over 6,500 Olympic-size swimming pools. They remove up to 90% of bacteria as they filter [1].

Climate Change Resilience:
- They sequester carbon at the same rate as old growth forests. [2]
- Howe Sound glass sponge reefs remove over 436 kg of organic carbon and 112 kg of nitrogen daily. [1]



Destroyed glass sponges in Howe Sound.
Credit Unknown. [7]

Why Are Glass Sponges Threatened?

- With skeletons made out of silica glass, they are extremely breakable.
  - Gear dropped on the reefs instantly crushes the sponges.
  - Over 50% of the reefs in Howe Sound have already been destroyed by fishing gear and anchors. [5]
- They are long living, but slow growing.
  - They take hundreds of years to grow to full size .
  - The oldest glass sponge in BC is 9000 years old. [8]
- Sediment stirred up from fishing activity covers the reefs, choking and killing these rare animals.

Alexander Dungate | alexanderjdungate@gmail.com | April 2021

Current Protections

• Marine Protected Areas (MPAs) have been set up to protect 17 glass sponge reefs, but 5 remain unprotected. Some MPAs (specifically Rockfish conservation areas) do not effectively protect the glass sponges since destructive bottom contact fishing is still allowed.

• The DFO is working jointly with Transport Canada to educate the public to avoid fishing and anchoring in closed areas. Posters and new marine charts have been made highlighting the closed areas, but destructive fishing is still taking place within the MPAs. This shows that boaters remain unaware of the reefs and their vulnerability. [4]

• The DFO is monitoring the closed areas with land, sea and air surveillance, but enforcement still relies heavily on citizens to report fishing violations to the DFO hotline [4].

• The DFO is reviewing research showing that a buffer zone is needed around reefs to protect the glass sponges from choking on disturbed sediment.

Recommendations

1. Protect the 5 remaining unprotected reefs, and upgrade existing MPAs to restrict all bottom contact fishing.
2. Establish buffer zones around the reefs to protect the reefs from suffocation due to sediment disturbance.
3. Expand awareness campaigns to make boaters aware of glass sponges, their value, and the threats they face.
4. Support ongoing research on glass sponges in Howe Sound.

These actions combat climate change, provide habitat for valuable commercial fish stocks, and protect these phenomenal creatures for researchers and tourists alike.

Conclusion

While the DFO has made progress in protecting the glass sponges in Howe Sound, without further protection these rare animals will continue to become irreparably damaged.

With the largest and most accessible glass sponge reefs in the world, British Columbia has a unique opportunity to protect a national treasure.

As research continues, support and further protection from the DFO is critical to save this irreplaceable species.

A diver with glass sponges in Howe Sound.
Credit: Adam Taylor. [6]

References

1. DFO. 2018. Glass sponge aggregations in Howe Sound: locations, reef status, and ecological significance assessment. DFO Canadian Science Advisory Secretariat Science Response 2018/032 43 pp. https://waves-vagues.dfo-mpo.gc.ca/Library/40714767.pdf 2. Luyssaert, S., Schulze, E. D., Börner, A., Knohl, A., Hessenmöller, D., Law, B. E., Ciais, P., & Grace, J. (2008). Old-growth forests as global carbon sinks. *Nature*, *455*(7210), 213–215. https://doi.org/10.1038/nature07276 3. Ocean Wise Research. (2020, January). Glass Sponges. Retrieved April 10, 2021, from https://research.ocean.org/project/glass-sponge-reefs 4. Finn, D. (2020, February 02). Update: Straight of Georgia and Howe Sound Glass Sponge Reef Conservation Initiative. Retrieved April 10, 2021, from https://missbc.com/2020/01/28/update-straight-of-georgia-and-howe-sound-glass-sponge-reef-conservation-initiative/ 5. Marliave, J. B., Borden, L. A., Schultz, J. A., Gibbs, D. M., & Dennison, G. J. (2018). Formation, persistence, and recovery of glass sponge reefs: A case study. In *Invertebrates-Ecophysiology and Management* (p. 131). IntechOpen. Retrieved from https://www.intechopen.com/books/invertebrates-ecophysiology-and-management/formation-persistence-and-recovery-of-glass-sponge-reefs-a-case-study 6. Sea of glass. (2020). Retrieved April 10, 2021, from http://glassspongereefs.com/ 7. 8 New Marine Refuges: Protection of Howe Sound Glass Sponge Reefs, BC. (2019, March 12). Retrieved April 10, 2021, from https://cpawsnl.org/8-new-marine-refuges-protection-of-howe-sound-glass-sponge-reefs-bc/ 8. Kahn, A. S., Yahel, G., Chu, J. W., Tunnicliffe, V., & Leys, S. P. (2015). Benthic grazing and carbon sequestration by deep-water glass sponge reefs. *Limnology and Oceanography*, *60*(1), 78-88.

Alexander Dungate | alexanderjdungate@gmail.com | April 2021

Contacts:

To the Attention of:

The Honourable Bernadette Jordan
Minister of Fisheries, Oceans and the Canadian Coast Guard
Minister's Office
200 Kent St
Station 15N100
Ottawa ON K1A 0E6
min@dfo-mpo.gc.ca

Patrick Weiler
Member of Parliament for West Vancouver-Sunshine Coast-Sea to Sky Country
6367 Bruce Street
West Vancouver, British Columbia
V7W 2G5
Patrick.Weiler@parl.gc.ca

Honourable George Heyman
BC Minister of Environment and Climate Change Strategy
PO Box 9047 Stn Prov Gov
Victoria, BC V8W 9E2
ENV.Minister@gov.bc.ca

Stakeholders:

Centre for Science Advice Pacific Region Fisheries and Oceans Canada
3190 Hammond Bay Road Nanaimo, BC V9T 6N7
Telephone: (250) 756-7208
csap@dfo-mpo.gc.ca

Glen Dennison
President, the Marine Life Sanctuaries Society
https://mlssbc.com/about-us/contact-us/

Deirdre Finn
Fisheries Management Officer, Sustainable Fisheries Framework
Fisheries and Oceans / Government of Canada
Deirdre.Finn@dfo-mpo.gc.ca / Tel: 604-666-2606